

simulation

A semi-annual news publication of Frasca International

FAA Qualification for Abinitio Training Devices

Frasca International is now offering FAA Level 2 and 3 qualification with its abinitio Flight Training Devices such as the Model 141, 142, and 242. These qualifications are made possible based on technology that Frasca developed for its multi-million dollar Full Flight Simulators. Recent advances in computer technology have allowed Frasca to use advanced aerodynamic software originally developed for airline and military Full Flight Simulators in its line of general aviation simulators.

Several recent customers have ordered Level 2/3 qualification for their Frasca FTD's. Higher levels of FAA approval are also available on Frasca FTD's and FFS's. FAA Level 2/3 qualification allows for additional checking credits in addition to the training allowances outlined in the FAA's part 61 and 141.

The University of Alaska (see related story on page 6), Roger Aviation, the University of Illinois and Purdue University have all ordered Level 3 Qualification for their Frasca Flight Training Devices.

Level 2 and 3 qualification require a very accurate simulation of the aircraft's flight performance. To meet this demand Frasca International developed a Six Degree of Freedom (6 DOF) aerodynamics package for their simulators. The 6 DOF aerodynamics package takes into account all of the major forces that act on an aircraft and includes angle of attack calculations. However, it is not enough to have good aerodynamics. The FAA requires that you prove that the Flight Training Device (FTD) matches the airplane. One way to prove

this is to test fly an aircraft and record it's performance. To allow this, Frasca developed a strap down sensor package that digitally records flight data and control pressures while the aircraft is flying. A Frasca test pilot then flies the aircraft through a regiment of tests while the recorder is on. Frasca aerodynamic engineers then take this data and use it to calibrate the 6 DOF aero model. They also incorporate this



Model 242 built for Roger Aviation.

data into an Acceptance Test Guide or ATG. The ATG is then used by the FAA to verify that the FTD matches the aircraft.

Other popular features include a 3-D plotter module for GIST (our Graphical Instructor Station), a parameter plotting module for GIST and Jeppesen Navigational Data. Frasca has also started promoting simulator packages that include many options at a special price. These packages are designed to take some of the guess work out of choosing "a la carte". Frasca offers such a wide range of options that many customers find it difficult to pick them. Currently packages exist for the Model 132, 142, 142T and 142J. For more information, contact our sales department at (217) 344-9200.

Rudy Speaks Out



Bidding or Gambling?

Over the years, I have come to accept the necessity of the competitive bidding process that all government and many private organizations require. If done properly, it helps organizations assure they get the best product for a reasonable price. It also helps to keep vendor prices realistic and features competitive.

For over 35 years Frasca International has been active and competitive in the bidding process because I recognized any vendor that cannot compete successfully most of the time won't remain in business very long. The bidding process has been one of many guides that helped us in a continuous program of improving our simulators to meet customer needs at a competitive price. I don't mind saying that our simulators are the best in the world. We have sold more units worldwide and offer the most diverse line of simulators of

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www.frasca.com

Customer Update

Several new & existing customers have recently added Frasca Simulators to their flight training department, they include:

American Flyers, Fort Lauderdale has added a Model 131 to their fleet of Frasca's.

Catalina High School, Tucson, AZ is also using a new Model 131 for flight training.

Pars Air, an FBO in Santa Anna, California has a new Model 132P.

Clovis Community College, Clovis, New Mexico has taken delivery of their Model 132 as has **Multi Engine Flight Training**, Medford, NJ.

Schools recently acquiring Model 141s include:

Waukegan Aero, Waukegan, WI.

Iron Range Aviation, Menominee, MI,

Lewis University, Romeoville, IL, and

South Sky Aviation, Ft. Lauderdale, FL.

Metro State, Denver, CO has added a Model 142 to their flight training program. (Metro now has 10 Frasca units.) See page 5 for a profile on their World Indoor Airport.

The **University of Illinois** has acquired their 3rd Frasca (a model 142), they also have two Model 141's and are working with Frasca on getting FAA level 3 approval for their simulator.

Milwaukee General Aviation, Milwaukee, and **Douglas Aviation**, Olive Branch, MS have both added Model 142's to their program.

R&M Aircraft Specialties, Las Vegas, NV visited the Frasca booth at NBAA last Fall and purchased the Model 142 on display.

Southwind Flight Training, Brownville, Texas has placed an order for a model 142 Wide with FVS-200HR visual system, HSI, RMI and GIST.

Other Schools with new Model 142s include: **Western Michigan University** - Kalamazoo, MI, **Mazzei Flying Service** in Fresno, CA, **Airway Flight Service** -



Model 242J built for the Chilean Direccion General de Aeronautica Civil (DGAC).

Wheeling, IL, **Ohio State University**, **Marlon Aviation** - Washington, D.C., **Lane Community College** - Eugene Oregon, **Outer Marker** - St. Louis, MO, **AV-ED Ground School**, and **Airway Flight Service** - Wheeling, IL

Comair Aviation Academy is using their new Model 142 for New Hire Pilot Evaluation at their pilot training facility in Cincinnati, Ohio.

Roger Aviation, Minneapolis, MN has ordered a model 242 with FVS-200HR, flight director, GPS and FAA Level 3 qualification.

The **University of Alaska** has placed an order for a Model 242 with several features including 3-axis motion and visual system. The unit will be hooked up to ATC and Radar tower simulators (see story, page 6)

The **Chilean Direccion General de Aeronautica Civil (DGAC)** has taken delivery of their Model 242J with three axis motion, 2-tube EFIS and a dual FVS-200 visual system (shown above). The simulator was installed at a facility in

Puerto Montte, Chile, where the Air Force intends to use the Model 242J for training courses for regional airlines.

The **Belgian Air Force** has completed factory acceptance of their 241/SF260 D upgrade. A second unit will be upgraded and shipped in June of 1996.

Simulation Newsletter

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1996 Trade Show Calendar

Dates	Show	Location	Booth #
May 20-22, 1996	RAA (Regional Airline Association)	Orlando, FL	#403
June 6-9, 1996	Forli Air Show	Forli, Italy	To be announced
June 22-July 1, 1996	Indonesian Air Show	Jakarta	To be announced
August 1-7, 1996	Oshkosh	Oshkosh, WI	#C-112
October 17-19, 1996	UAA Fall Meeting (University Aviation Association)	San Jose, CA	To be announced
November 19-21, 1996	NBAA (National Business Aircraft Association)	Orlando, FL	#2214

For more information on Frasca's product line, return this card to us!

We need your help updating our mailing list! Please tell us if you are NOT interested in receiving future copies of the Simulation Newsletter or if you'd like to add a name to our mailing list. (No need to bother if you want to keep receiving the newsletter... we'll leave you on the mailing list if we don't hear from you.)

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☐ Please have a representative call me.

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- ☐ Model 131, Basic Single Engine Flight Simulator
- ☐ Model 132, Basic Twin Engine Flight Simulator
- ☐ Model 132P, Professional Package Twin
- ☐ Model 135, Helicopter Simulator
- ☐ Model 342, Single Engine Turbine Helicopter Simulator
- ☐ Model 141 or 142, Advanced Single & Twin Engine Flight Simulators
- ☐ Model 242, High End, side-by-side cockpit, Twin Engine Flight Simulator
- ☐ Model 242T, Twin Engine Turboprop Flight Simulator
- ☐ B1900C FTD
- ☐ Certified Flight Training Devices (FTD's) & Full Flight Simulators (FFS's)
- ☐ Visual Systems
- ☐ GIST (Graphical Instructor Station)



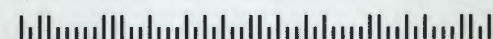
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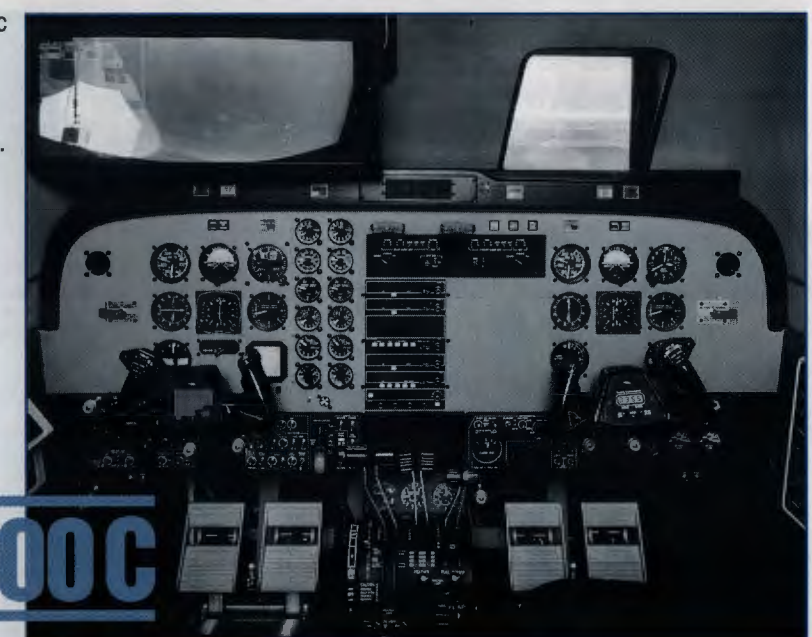
When we introduced our B1900C FTD last year, we knew it was a good simulator at a great price. Now, a year later with two delivered and other sales pending, it's become one of Frasca International's success stories.

Faced with limited budgets and new safety regulations, Regional Airlines are looking for affordable, high fidelity flight training and the B1900C FTD is able to meet those requirements.

The B1900C FTD is a cockpit specific device designed to simulate the Beech 1900C aircraft. The first device was delivered to Delta State University in Cleveland, Mississippi in November of 1995. A second unit has been delivered to Gulfstream Airlines in Miami, Florida. The device can be modified to fit each

customer's specific requirements; such as type of visual system, etc.

Additional orders for the B1900C FTD are pending with flight training schools and regional airlines worldwide.



B1900C FTD panel built for Gulfstream Airlines.

News in Brief:

■ In our last Newsletter, we asked our customers to tell us about Frasca simulators with impressive hobbs-readings (How Many Hours does Your Frasca Have On It?) One of the customers we heard from is the **University of North Dakota** in Grand Forks, North Dakota. A long time customer of Frasca, UND has a dozen Frasca simulators with a total of over 157,000 hours of flight training use! The most impressive being a Model 141 with over 21,000 hours on it!

■ Frasca International is the recipient of the **1996 Governor's Export Award** in the

category of Continuing Export Excellence for the State of Illinois. The award was accepted from Illinois Governor Jim Edgar by Rudy Frasca on May 16th during a luncheon held at the Chicago Hilton Towers.

■ Frasca International sponsored the **Instrument Flying Event** at the **1996 NIFA/SAFECON meet** held at Embry-Riddle Aeronautical University in Daytona Beach, Florida. In previous years, this competition was done in the actual aircraft and judged by observers. The result was less than objective because scoring was done subjectively by many

different observers. In addition, real world traffic and weather would frequently disrupt the competition. Frasca and ERAU reintroduced the event on a trial basis using a Frasca model 141. The Model 141 was equipped with GIST and a special lesson plan that initiated the flight and performed all scoring. The lesson plan would automatically initialize the simulator conditions, provide clearances and score the flight. The flight consisted of IFR departure, VOR tracking, a holding pattern and an ILS approach. Nineteen pilots competed in the event which was won by Eric Kjeldjaard from Parks College.

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Indonesian Army Accepts BO-105 Full Flight Simulator

The Indonesian Army performed factory acceptance on their BO-105 Full Flight Simulator (FFS) in January of 1996. The BO-105 was originally built by Frasca as a fixed base simulator in 1989. Frasca was awarded a

contract to upgrade the unit to FFS status in 1994. The upgrade included a complete factory refurbishment of the cockpit, the addition of six-axis motion base, three-channel visual system and a new IOS featuring GIST. The unit will be installed at the Army's Training Center in Semarang, where it will join a Frasca built NB-412 FFS that has been in operation since 1990.



BO-105 simulator instrument panel.



BO-105 FFS built for the Indonesian Army.

U.S. Army Uses Frasca FTDs in Helicopter Study

A U.S. Army study at Fort Rucker, Alabama is being conducted to determine if pre-training ab initio helicopter pilots candidates in a Frasca TH-67 Flight Training Device (FTD) will produce student aviators with better skills.

The study, a joint effort of the Army Research Institute and Fort Rucker's Aviation Training Brigade (ATC), will pre-train half of

each initial entry rotary wing class in the Frasca simulator before they begin their 60 hours of flight training. The FTD will be used primarily as a hover trainer, but also to demonstrate basic helicopter flight maneuvers, including take-offs, approaches and landings.

The Frasca TH-67 closely resembles the cockpit of the Bell TH-67 Creek, a slightly

modified Bell 206 JetRanger. The Frasca simulator is upgraded from the procedures trainer now used for initial cockpit familiarization for engine start and ground operations. With full dual flight controls and instrumentation, the FTD also has a visual display system that provides a computer-generated external scene.

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Tips from Customer Service

The following tips come from Richard Fitzgerald, Senior Customer Service Engineer at Frasca. The Customer Service Department is available to our customers from 8:00am - 5:00pm (Central time), M-F (excluding holidays). You can contact us via phone: 217-344-9200, FAX: 217-344-9207 or e-mail: help@frasca.com.

■ **Spring Cleanup:** Along with cleaning out the hangars and waxing the planes, it's time to perform annual maintenance on your simulators. So get out the vacuum and dust rags and go to work! The following procedure is designed for the 141 and 142 simulators.

■ **Remove the Shell (optional):** Unplug the simulator from the AC Power source and remove the shell from the trainer. This will

Windex to clean the instrument panel and instruments. Spray the cleaning solution on the rag instead of directly on the panel as this lessens the chance of dousing an electronic assembly and ruining your day. On the floor mat use any good cleaner. For a nice finishing touch wipe down the floor and glare-shield with Armor-Ail. The shells on the trainer are made from fiberglass. When cleaning these surfaces, test the cleaner in a small spot to insure that the cleaner will not stain the fiberglass.

■ **Circuit Boards:** Damage can occur to the circuit boards and electronic assemblies if not cleaned properly. Please contact our customer service department and they will be happy to walk you through the do's and don'ts of cleaning this equipment.



Frasca Model 141 simulator with Graphical Instructor Station (GIST).

allow you complete access to the internal workings of the trainer and make the task of cleaning much easier.

■ **Clean the Trainer:** Using a vacuum, clean the trainer thoroughly. Be sure to pay special attention to the filters on the chassis and power supply fans. If you cannot get the filters clean with the vacuum, remove them from the assembly and clean with water and a mild detergent. Dry thoroughly before re-installing on the trainer.

Next, using common cleaning solutions and rags wipe down the trainer. I usually use

When working on the trainer, it is always a good idea to make a visual and physical inspection, look for loose hardware, frayed or damaged wires, and abnormal wear. If you see something that you are unsure of contact our customer service department.

■ **Elevator and Aileron Control Group:** The elevator control column is attached to the control wheel. The control column has two pillow block bearings (located at the bottom of the column near the floor). These bearings have lubrication cups. Use a light weight oil to fill the oil cup of these bearings. Clean the control

wheel tube thoroughly to remove any built up dirt and residue. Using a white grease (lithium based) lightly lubricate the control wheel tube. Inspect the elevator trim carriage. Remove any large build ups of grease on the lead screw. Lubricate the lead-screw with a light coating of wheel bearing grease. Do not over lubricate, this will cause the trim carriage to drag. The control column also contains the elevator and aileron control force springs. If these assemblies are squeaking spray them with a light multipurpose spray lubricant. Inspect the control springs and test for strength. If the springs feel weak, they need to be replaced.

■ **Rudder control system:** The rudder pedal control group is a little bit more difficult to get to. The trainer must be lifted up for access.

Warning: Be sure to use proper safety techniques when lifting and supporting the equipment. If you have any questions, please contact customer service prior to proceeding.

If you have a 142 trainer, it has an electric rudder trim carriage. Clean and lubricate the carriage as you did the elevator trim carriage. If the trainer has a large number of hours on it and the rudder trim feedback potentiometer replace it. If you need instructions on replacing and calibrating the potentiometer, contact the customer service department.

■ **Seat Assemblies:** Lubricate the seat rails with a light coating of wheel bearing grease.

After you have completed these tasks, go over the trainer one more time and inspect the trainer. Be sure to take the time to go through and tighten all of the hardware on the trainer, especially on the instrument panel. You may even want to put a nice coat of wax on the shell prior to installation. Do not attempt to wax the interior of the shell. Due to it's texture the surface is almost impossible to wax.

■ **Calibration:** With the shell off and everything clean, now is a good time to calibrate the simulator. Detailed maintenance and calibration manuals are available from the customer service department at a cost of \$65.00.

By taking the time to do a thorough job of cleaning, lubricating, and inspecting the simulator, you will add numerous hours of training throughout the year. Contact Customer Service for more information.

Customer Profile: Metro State, Denver

Metropolitan State College of Denver is a long time user of Frasca Simulators. They have become well known for their World Indoor Airport (WIA) and have recently been in the news for replicating an around the world speed record set by Bill Daniels.

The WIA is a virtual reality facility designed to train pilots, air traffic controllers and aircraft maintenance professionals. The Metro State Aerospace Science Aviation Lab consists of ten Frasca Model 141's, two Model 142's, a Model 242T/J and two DC-10 cockpit simulators donated by United Airlines. All of the equipment is integrated so that student pilots can communicate with student air traffic control stations.

On February 12, 1996, four Metro State students simulated Bill Daniels attempt to set a world speed record for a light business class jet (Learjet 35-A) using their Frasca Model 242T/J configured as a Learjet 35-A. When Daniels crew touched down to refuel in eight locations around the world, Metro State's crew also touched down at the same locations. The simulator can be programmed

with the proper coordinates to land at any airport in the world.

In the end, the world record was broken and another world record was established.

The Daniels Learjet landed at 4:29 am on February 14th with an elapsed time of 49 hours and 22 minutes. The distance flown was 20,480 nautical miles (23,555 statute miles). The Metro State Aerospace Science students landed their FRASCA Model 242T/J at the same time.

The department's program has been written up in Aviation Week & Space Technology.

Information was sent via the Internet to over 1,500 aviation outlets around the world during Metro's simulated flight.

According to Bob Mock, Chair of Aerospace Science at Metro State, "Frasca

has played an integral part in the development of the World Indoor Airport. The WIA has taken seven years to bring to fruition and the staff at Frasca has been most



Metro student pilots (l to r) Janell Martin, Karl Van Loo, Jason Tautfest, and Steve Brown configure the 242T/J for its flight.

supportive in our efforts, including providing assistance with the Wesson ATC interface to the Frasca simulators."

For more information on Metro State's Aviation program, call: (303) 556-2982.

University of Alaska to Use Frasca FTD

242 to be interfaced to ATC/Tower Simulators

The University of Alaska, Anchorage has placed an order for a Frasca Model 242 FTD. The 242 FTD will be able to be quickly configured as either a single or twin engine aircraft and will also include a three-axis hydraulic motion base, two window FVS-200HR visual system with collimated display, a custom airport data base and GIST. The FTD will be built to FAA Level 3 standards and is part of a subcontract to Wesson International, who are providing tower and ATC radar simulators to the University.

Once installed (in early June of 1996), the Frasca FTD, the Wesson tower simulator and

ATC radar simulators will all be interactive. The FTD will be interfaced such that it shows up in the tower simulators view and on the ATC radar screens. Radio communications will also be simulated, allowing for a completely interactive system. For more information on Wesson International, check out their web page at www.wesson.com

Frasca to Supply 7 FTDs to Indonesian Civil Aviation Academy - CURUG

Frasca International has been awarded a contract to supply seven Flight Training Devices (FTDs) to the Indonesian Civil Aviation

Academy (CURUG). The FTDs include four Socata TB-10, two Beech B-58 Barons and one Socata TBM 700. The contract was awarded in early 1996 and the first simulators will be delivered this summer.

Happy 65th Birthday Rudy!

Rudy Frasca celebrated his 65th birthday on April 19th, 1996. Although this is the traditional age for retirement, Rudy says he is nowhere ready to retire (causing much distress among his children, all of whom work in the business!) Says Rudy; "Although I've been spending even more time flying, so much is going on with the company that I want to remain an active part of it. Business is great and things look very good for the future."

Rudy Speaks Out

continued from page 1

any manufacturer. The result is that Frasca simulators are training professionals in over 70 countries.

No company wins every bid, of course, but we are far more successful than not. One of the problems we have encountered over the years stems from the fact that simulation is not a science. All too often the end user is required to turn over a basic set of criteria to a purchasing agent for the organization who has no understanding of simulation. The agent will attempt to translate the criteria into some rough specifications and subsequently accept the lowest price. All too commonly those specifications come from information supplied by the first salesman that approaches the purchaser and no attempt has been made to look at competitive units. We all know a great salesman can convince a potential customer to buy just about anything. Unfortunately, sometimes the salesman is so good that the customer will no longer even listen objectively to anyone else. This is a critical point for the potential simulation purchaser.

Over the years I have heard some true horror stories made all the worse because we could have furnished a far superior simulator at a competitive price. There are schools that have purchased equipment from manufacturers who subsequently went out of business leaving them with no support, scant spare parts, and poorly operating equipment. Still other manufacturers, in business but barely surviving, are unable to technologically update their equipment and will often leave customers with little or no support services. There are schools that have had to shut, or are in the process of shutting their doors, at least in part because of a bad choice of simulators. It seems the high acquisition cost of the original equipment coupled with its subsequent inability to work properly, the manufacturer's inability to service it, and the very low resale value of the equipment because of its poor reputation, financially made the school no longer viable.

If you are considering purchasing a simulator, I urge you to talk to the many organizations that own the various types of equipment and get their opinions before making any commitment. Talk to the instructors and

administrators of the most successful university flight programs; you'll discover their success is, in part, due to the simulators in their program. Reliability, training value, and cost effectiveness are the key components that they looked for; find out what they think about the simulators they are using. Ask them whether or not the simulators meet FAA requirements to provide training credit (now and in the future). Also, contact the various simulator manufacturers and obtain their product information; compare the information to one another. Always get Dunn and Bradstreet reports on the companies to determine if it appears they will be around long enough to support their equipment. And most importantly, take the time to visit each factory and fly the simulators.

Of course, it is convenient for someone to come to you; they may even offer to bring a simulator with them, but instead go look at their factory and the people who work there. That will tell you a lot about what to expect in the future. Ask to see their parts department, a direct indicator of the kind of support you can expect when you have a problem. Ask questions about the credentials of the

employees, what kind of training programs they have for employees, and what kind of training programs they have for the purchaser's instructors and maintenance personnel. If you are really serious about purchasing a simulator and have the budget to do so, the company will probably share the cost of your trip to the factory or subsequently apply your cost to the purchase of the equipment. Remember, regardless of the promises and what the pretty brochures say, you will have to live with what you buy for a very long time provided it doesn't shut down your program altogether.

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- 132/142/242 Standard twin engine
- 242T/242J Turboprop and jet engine
- Helicopter
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- Visual systems
- Motion bases
- Jepp Nav Data compatible
- & many more!



Frasca Model 140 simulator with Graphical Instructor Station (GIST).

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Practical Test Tips from the Examiner

by Gary W. Kiteley, Executive Director
University Aviation Association

The following article appeared in the National Association of Flight Instructors Newsletter and is reprinted with permission of the publisher.

This article deals with the use of simulators or ground training devices in connection with the instrument rating practical test. I recently received a letter from the FAA which clarifies the use of ground training devices for flight tests:

When taking the practical test for an instrument rating, the applicant, at the discretion of the inspector/examiner conducting the test, may perform two of the instrument approaches not selected for flight demonstration in a ground training device that meets the requirements of Section 141, subparagraph A, subparagraph 1 of the FAR. The remaining one instrument approach must be conducted in an airplane or helicopter as appropriate.

For clarification, let us review the requirements for such devices as stipulated in FAR 141. Each pilot ground trainer must have:

(1) An enclosed pilot station or cockpit which accommodates one or more flight crew members; (2) Controls to simulate the rotation of the trainer about 3 axes.; (3) The minimum instrumentation and equipment required for powered aircraft in 91.205 for the type of flight operation simulated; and (4) For IFR instruction a means for recording the flight paths simulated by the trainer.

Hopefully, this review of the regulations and PTS will clear misunderstandings that have arisen. Speaking from an examiner's perspective, I think the use of devices for conducting the practical test for the instrument rating is very appropriate and provides an opportunity for both a fair and comprehensive evaluation. I will cite a recent case: An applicant called me the day before he was scheduled for an instrument rating practical test with the bad news that his ADF receiver was not functioning. I asked him if he had ever flown in a flight training device and when he indicated that he had I suggested the use of the device for the NDB approach. We went ahead and scheduled the flight test which consisted of conducting an ILS approach and a nonprecision VOR approach in the airplane. After landing, we went to the simulation lab of Auburn University which has two Frasca 141's with visual systems

and a 142. I observed him perform an ADF approach with a 12 knot crosswind down to minimum at the local airport with the visual system set to break out about 50 feet above MDA. The applicant performed the approach to PTS standards and broke out at MDA about a mile short of the runway. During his approach, I was able to observe both his flight procedures in the cockpit as well as the graphic display on the computer screen which showed his flight path in relation to the course. The applicant was able to walk away with an instrument rating rather than waiting several days or weeks while he got his ADF returned to service.

The ground training device provides an excellent opportunity for a partial panel approach in that the pilot will receive no visual cues while performing the approach as is often the case in the airplane when he/she has to cross-check the magnetic compass. For those of you preparing for the instrument rating, I would strongly encourage you to take advantage of training opportunity for the device if one is available to you. The use of the ground trainer will provide greater breadth and depth in your instrument training as well as providing the opportunity for taking a portion of your flight test in the trainer if your airplane is not completely equipped.



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